

mal springs derive their origin from the volcanic agent. This opinion is deduced from the positions of these springs, and the influence of volcanic eruptions upon them. It has been noticed by writers, that there are three places in which thermal springs may be found : in the vicinity of active volcanoes, in mountain chains formed by volcanic activity, and in rocks which have suffered intense physical convulsions from igneous causes. It cannot be said that thermal springs are never found in situations which do not present any external evidence of violent disturbance ; but if they do occur in such situations, the circumstance cannot be urged as a proof that thermal springs are not produced by the volcanic cause.

In the vicinity of Etna, Vesuvius, and Hecla, hot springs are abundant, and in Iceland they are so numerous and active that they may be spoken of as the characteristic phenomena of the island. But they attend extinct cones, as well as those which are active ; for there are many in the ancient volcanic districts of the south of France, Hungary, and Bohemia. In the Pyrenees, and in other lofty chains which owe their elevation to a great subterranean movement, they are also found, and are especially frequent in those places which have suffered from intense physical convulsions.

These facts are sufficient to prove that thermal springs are produced by the volcanic cause ; and it is singular that, in proportion to the extension of geological knowledge, observers have been convinced of the universality of the volcanic force. There are some writers who seem to rest the proof of the volcanic origin of hot springs upon the effects which are produced on them by eruption ; but this appears to us much less conclusive than that deduced from their position, since it often happens that cold springs, not supposed to be connected with the subterranean agent, are equally affected.

There has been some dispute among geologists as to the origin of the hot springs in England. It is true that we have no burning mountains, nor are we spectators of those scenes of devastation which equally prevail in tropical and in polar climes, amid the frozen recesses of Iceland and in the pleasant places of Italy. But it must not on this account be said that the volcanic agent does not exist beneath the rocks of our own as well as other countries, for there may be in one place causes tending to excite activity, and in another causes which restrain it. so that in one district it